NORTHERN TERRITORY NATURALIST

july 1979 vol.1 no.2

THE NORTHERN TERRITORY FIELD NATURALIST CLUB
FOUNDED 1977

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EDITORIAL

Contributor response to this, the second edition of Northern Territory Naturalist has proved disappointing, and is largely responsible for the delay in getting this issue to press.

The expected avalanche of original and enlightening observation embodied in typescript form failed to arrive at the editor's desk. In this vein I can but reiterate the words of our previous editor, that "contributions are welcome from all naturalists, both amateur and professional, junior and senior". The only qualification that I might add is that articles for publication should be of substantial Northern Territory content.

For a while it appeared that this issue was taking the form of a herpetological journal, but fortunately, the receipt of some eleventh hour manuscript ensured an edition of a more balanced nature. Perhaps the imbalance of subject matter received indicates an inordinate number of herpetologists and aspiring herpetologists resident in the Territory. But there was also a suggestion that the herps are simply a more energetic lot - on that I decline to comment.

On a more serious note I would like to use this column to express the thanks of the NTFNC to Rob McConchie for the time and effort he volunteered as editor during publication of the first edition of Northern Territory Naturalist.

Production costs have forced a reduction in the print run of the second edition. So any member requiring an additional copy for a friend should move promptly as we are envisaging an early sell-out. Additional copies at $2 are good value when it is considered that each copy is costing around $3 to produce.

LETTERS TO THE EDITOR

Dear Sir,

On a recent diving trip to Cape Fourcroy, on the western side of Bathurst Island, our group had the opportunity to witness what must surely be described as unusual animal behaviour. While travelling in a 4.2 m aluminium dinghy we came across a group of live dolphins apparently asleep on the surface of the water. These dolphins were floating motionless with their air holes exposed. The greatest distance between any two dolphins in the group would have been approximately one metre.

Another dinghy approached the first dinghy, in order to observe these animals. The noise of the outboard approaching did not disturb them, nor did the approach of three skin divers in the water. The dolphins allowed the three divers to mingle with them and continued their inert floating. It was only when the dolphins were actually touched that they reacted and swam off for a few metres to again resume their inert floating. After several disturbances they swam slowly around us until we tired of the novelty and returned to our boats.

Much to our amazement the same group of dolphins were observed about an hour later rolling, or what we called "playing", in the breaking waves on the shoreline. One of our party grabbed a large dolphin by the tail and hauled it onto the sand, well clear of the water, in order that photographs could be taken. Imagine our surprise when on being returned to the water the dolphin showed no desire to swim off. In fact it was quite content to be patted, rubbed, and nursed while in 1 - 1.2 metres of water. When its underside was rubbed it would roll onto its back and remain in that position until another breath of air was needed. Successful attempts were made to touch the other dolphins and in the finish all dolphins were being nursed and scratched while photographs were taken. Several dolphins even gave short tows when divers held onto their dorsal fin.

Next morning we were disappointed to observe that during the night three of the dolphins had beached themselves. Two were still alive and fortunately these appeared to suffer no ill-effects from their beaching, as they swam around normally when returned to the sea.

We continued diving in the area for another day but did not see the dolphins even though we checked to see if they had beached again.

I would be interested to hear if anyone else has had similar experiences with dolphins.

W.R. Allen

Editors Note:

From Mr. Allen's photograph, the dolphin can be identified as the short-beaked Dolphin (Orcaella brevirostris), an inhabitant of coastal areas, estuaries and rivers (including fresh water reaches), from South-east asia to Northern Australia.

NEW REPTILE RECORDS FOR THE NORTHERN TERRITORY.

By R. Wells

One snake, Typhlina ligata and two lizards, Menetia maini and Notoscincus kinghorni are reported for the first time as elements of the Northern Territory herpetofauna. Additional data is provided for Notoscincus ornatus, and Notoscincus wotjulum, species well-known from other states but rarely collected in the Northern Territory.

ROBUST BLIND SNAKE (Typhlina ligata).

Several specimens of this snake, not previously known from the Northern Territory, were recently discovered in the vicinity of Darwin. Most were found beneath objects flush with the ground, such as concrete slabs, rocks and logs, in areas of low elevation (approximately 20 metres above sea-level); the habitat was open Eucalyptus woodland with spear grass (Sorghum sp.) with a substrate of firm slightly moist lateritic soil (with iron stone pebbles 5 - 10 mm. in diameter near the surface). One specimen (R4687) was discovered active on the surface at 2245 hrs on the 18th June, 1977. Specimens have been located sympatrically with T.unguirostris, T.diversa and T.bramina, but it appears to share greater habitat compatibility with T.unguirostris; both T.diversa and T.bramina seem to favour the damper, finer soil areas - particularly the latter species.

T.ligata shares the mid-body scale-count of 24 with only one other Australian Blind Snake, T.unguirostris, from which it can be distingushed by its hand shape. T. ligata the head in evenly rounded when viewed from both the top and side, whereas in T.unguirostris, the snout is sharply angular in profile - hence its common name of Hook-nosed Blind Snake. Both species are similar in colouration, but T.ligata usually has the tope of the head "streaked" with varying shades of brown on a lighter background; this is absent in T.unguirostris.

It was once regarded as a strictly East Australian species until Storr (1965) reported a specimen of T.ligata from the Ord River in Western Australia.

Northern Territory Museum, Darwin.
22 km. N.E. Noonamah R2925; 30 km. S. Darwin, R2946; Millner (suburb of Darwin)' R3120, Berry Springs Reserve, R3279, R4012, 25 km. S. Berrimah, R3301; 27 km S. Darwin, R3477; 11 km S. Berrimah, R4687.

MAIN'S SKINK (Menetia maini)

Three specimens from two separate localities in the Northern Territory, represent considerable range extensions for this otherwise Western Australian lizard. During February, 1977 two adults were secured near Pine Creek, active in leaf-litter at the base of small shurbs in an undulating area; the soil was firm lateritic, with small ironstone pebbles on the surface. The third specimen, also an adult, was taken during the same period at Ban Ban springs Station. It was discovered beneath leaf-litter at the base of a tree on a rocky hillslope. The habitat here is much the same as at Pine Creek.

Specimens of M.maini were previously known only from the Derby area and Prince Regent River, in the Kimberley Division of Western Australia (Storr 1976.)
Northern Territory Museum, Darwin.
5.5 km N. Pine Creek, R31001; Ban Ban Springs,. R3181.

KINGHORN'S SKINK (Notoscincus kinghorn)

Until quite recently, this lizard was known from only a few individuals, taken along the Darling River (betwen Bourke and Wilcannia) New South Wales (Copeland, 1947; Worrell, 1963; Cogger, 1975) and a specimen from Dunkerry Station, via Thallon, S.W. Queensland (Hosmer, 1956). It is now known that it occurs over a wide area in New South Wales and Queensland, mainly occupying the black soil plains.

A specimen collected on Brunette Downs station N.T. (Barkley Tableland) apparently represents the first record of its occurance outside the Eastern States. It was discovered in May 1977, trapped in a workshop pit at the Station's Homestead by Mr H. Van Dyke who kindly donated the specimen to the Northern Territory Museum in Darwin.

N. kinghorni can be immediately distinguish-

ed from other Notoscincus by its distinctive pattern of narrow whitish longitudinal stripes (with brownish intervals) on the body and a bright red tail. Its low mid-body scale-count of 22 (against 26-28 in N.ornatus and 30-32 in N.wotjulum) may also be useful.

Northern Territory Museum, Darwin.
Brunette Downs Homestead N.T., R.3673.

BROOM'S SKINK (Notoscincus ornatus)

Previous records for this skink's occurance in the Northern Territory were confined to a single mention of a specimen from Hurst Creek, 10 km S. Wauchope (Storr 1974 a). On the 2nd September, 1975, Mr. P.R. Rankin secured a specimen 68 km S.W. Alice Springs; it was discovered beneath a thin, partly embedded stick on a small sand dune, and when disturbed, attempted to escape down a near vertical burrow. A further specimen was collected by Mr. B. Jukes soon afterwards (27th February, 1976), at Maryvale on the western boundary of the Simpson Desert. He reported locating it and several others beneath grass clumps on sand dunes.
Australian Museum, Sydney
68 km. S.W. Alice Springs R52054.
Northern Territory Museum, Darwin.
Maryvale, R2351.

WOTJULUM SKINK (Notoscincus wotjulum)

Northern Territory records for this lizard were unknown until Storr (1974 a) made mention of a specimen that had been secured 8 km. S.E. Oenpelli. During 1977 numerous specimens were found throughout the Katherine - Pine Creek - Adelaide River region. Although they can be located in the limestone karst areas such as near Katherine, they are certainly more abundant in the granite hills further north. This is another leaf-litter species, preferring the verges of non-perrenial streams in areas of open Eucalyptus forest. They forage late in the afternoon, usually in the litter but also around broken rock, and when rustling through dry leaves, their immediate appearance leads one to believe that they are merely one of countless Carlia also present. Upon closer inspection however, N.wotjulum bears a striking resemblence to some elements of the Morethia in its body form and behaviour; they are extremely alert and appear to have excellent eyesight for such a small surface-dwelling lizard.

Northern Territory Museum, Darwin.
Katherine area, R2863; 17.5 km. E. Daly River P.O., R4123-9; 8 km. N. Pine Creek, R3108; 5.7 km. N. Pine Creek, R3389-90; 20 km. N.W. Pine Creek, R4582-3.

ACKNOWLEDGEMENTS.

The author wishes to thank Dr. Colin Jack-Hinton and Graeme Gow, of the Northern Territory Museum in Darwin for the opportunity to examine specimens as well as for general encouragement. The generous assistance of Norm and Chris Boyd, Chris Cox, Mike Fisher, Brian and Kay Jukes, Keith Martin, Dean Metcalfe and Peter Rankin is greatly appreciated. This work was carried out under authority from the Territory Parks and Wildlife Commission, Darwin and their assistance and advice is also appreciated. Miss Jenny Cochrane kindly turned an otherwise undecipherable manuscript into excellent typescript.

EXTENSION OF RANGE IN THE HORSESHOE BAT

By John L. McKean & A.L. Hertog.

INTRODUCTION

The Diadem Horseshoe Bat Hipposideros diadema is a tropical species with a wide distribution ranging from the Asiatic mainland eastwards to the Solomon Islands (Hill, 1973). In this broad range there is extensive morphological variation and at least 18 subspecies occur. H. diadema was first discovered in the Northern Territory in 1969 when 13 specimens were collected by B.L. Bolton, D. Howe and S.A. Parker in Deaf Adder Gorge, Arnhem Land. A distinctive new subspecies H.d. inornatus was described from these specimens (McKean, 1970). Three specimens were collected by a CSIRO field party including McKean on November 16, 1972 at a water hole near Cannon Hill in Arnhem Land. In the absence of records from elsewhere, the N.T. form was then considered to be an endemic confined to Arnhem Land.

On the night of September 16, 1978, Hertog located a group of 15 H. diadema in a cave near Mt. Tolmer Falls (lat. 13 13'S long. 130 47'E). The cave measuring about 3.5m long, 6m wide and 3m high was situated in a sandston cliff. The entrance to the cave was approximately 0.5m in diameter, and the cave microclimate could be described as hot and dry. The vegetation in the near vicinity is dense monsoon forest dominated by various palms. Vine and creepers are common and the canopy is almost closed. A small creek runs through the gorge and a large pool of water is situated about 150 metres from the cave. The discovery of this colony extends the known range of H. diadema 185 kms westwards. It would be desirable to search for the species in the Victoria River area and in the sandstone gorges of the Kimberleys that carry a relict 'rainforest vegetation.

Of the 15 H. diadema in the cave, 10 had light grey brown pelage and 5 had bright orange pelage. Although no previously reported from the N.T. population this latter colour phase is known from most of the other subspecies. A colour photograph of one of the orange phase bats was taken and a black and white print has been used to illustrate this note.

REFERENCES.

Hill, J.E. (1963 A Revision of the Genus Hipposideros, Bull, Brit. Museum (Nat. Hist.) 11 : 1 - 129.

McKean, John L. (1970) A new subspecies of the Horseshoe Bat, Hipposideros diadema from the Northern Territory, Australia, W.A. Nat. 11 : 138 - 140.

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The Diadem Horseshoe Bat (Hipposideros diadema).

AN OBSERVATION OF PIRACY IN THE BLACK FALCON, Falco Subniger AT DARWIN N.T.

By Mr. J.A. Estbergs and Mr. R. Garstone

On the afternoon of the 7th of August 1977, we were taking observations on the feeding behaviour of Grass Owls (Tyto longimembris) at Holmes Jungle floodplain area, a distance of approximately 12 kilometres east of Darwin. On this occasion were accompanied by Mr. H.A.F. Thompson, Ms C. Petersen, Mr. D. Kingston.

We had been visiting the area morning and evening over the past three days and had seen a Black Falcon present on most trips.

At about 1830 hours which was half an hour before sunset we were looking through binoculars at three Grass Owls 100 metres away flying at about four metres above the ground. We made a quick scan of the area to try to locate more Grass Owls and observed a Black Falcon flying low and rapidly over the plain behind us. We returned our attention to the owls in front of us just in time to see one dive into the grass. A few seconds later it rose with a rat clutched in its talons. We then heard a bird call to our right and looked in that direction seeing another Black Falcon. This bird was flying low and swiftly towards the Grass Owl with the rat. The Black Falcon was being pursued by two Little Falcons (Falco longipennis), these birds having made the call. They dive bombed the Black Falcon which skillfully avoided them and drew closer to the Grass Owl with the rat. On catching up to the Grass Owl the Black Falcon did not slow up. It came up from underneath the Grass Owl, rolled over in flight and plucked the rat from the owl's grasp. This interaction took only seconds. The Black Falcon continued on flying away low and fast with the two Little Falcons still in pursuit. The chase went on for another 100 metres after which the Little Falcons broke off their attacks. The Black Falcon flew on and over a hill with its stolen meal.

To the best of our knowledge this is the first recorded event of piracy by a Black Falcon, and probably the first act of piracy ever recorded where an owl was the pirate's victim.

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GROWING NATIVE FERNS OF THE NORTHERN TERRITORY

By Suzanne Avery and Alan Wade

The variety and attractiveness of native ferns makes their incorporation into a native garden well worthwhile. The majority are readily cultivated. According to distributions of ferns documented by Jones and Clemesha (1976), there are about forty five species represented approximately twenty nine genera in the Northern Territory. Chippendale (1971) reports fifty two species of which thirty eight are found in Darwin-Gove area.

Many ferns will grow at least as well under cultivation as in their natural state provided they are supplied with an organic fertilizer and are regularly watered. Some drought resistant ferns such as the basket fern (Drynaria quercifolia) and the rock fern (Cheilanthes tenuifolia) respnd well to watering and commence active growth before they would do so naturally. Most ferns, however, are restricted to permanently wet areas and commonly grow year round. Ferns appear to reach their greatest diversity on rainforest margin. For example, in some localities around the Finnis River, it is not unusual to find six or seven species within a half kilometer radius. Other ferns grow in open soaks, in moist gullies or in almost purely aquatic habitats.

Propagation of ferns from spores is often difficult. This is due in part to the complex life cycle of the fern. A spore first develops to form a delicate prothallus: a young fern develops when the prothallus is fertilised. In practice, spores from adult ferns must be viable, moist conditions are required at all times and sterile culture media are a pre-requisite for the successful culture of a single species. One fern that is readily propagated from spores is the common wedge fern (Lindsaea ensifolia). Young adult ferns appear within six months under adult ferns provided conditions are fairly moist.

A number of ferms may be propagated by rhizoime (stem) division. The climbing swamp fern (Stenochlaena palustris,) the northern kangaroo fern (Miscrosorium scolopendria) and the creeping swamp fern (Cyclosorus interruptus) have vigorous long creeping rhizomes that make them obvious and candidates for propagation by simple division. Ferns that grow in clumps are also readily divided. Perhaps the best example of natural rhizome division is found with the northern swamp fern (Blechnum orientale). It grows in large dense clumps in well drained spring fed swamps. A single plant placed in a large pot developed five independent plants with separate root systems in a little over a year. Other examples include the common wedge fern (Lindsaea ensifolia), the hay-rake fern (Dicranopteris linearis), the attractive snake fern (Lygodium microphyllum) and the mangrove fern (Acrostichum speciosum). The basket fern (D. quercifolia) colonizes rocky outcrops and large tree trunks and can be readily grown from a small section of its massive fleshy rhizome.

Climbers and ferns with large leaves should be trimmed back fairly well when they are transplanted. This reduces water loss by minimizing transpiration through their leaves. Ferns have remarkable regenerative capacity provided the plants have the maximum opportunity to re-establish their root systems. Pruning and watering are the main requirements for successful transplanting of fern

ECOLOGICAL CONSIDERATIONS

The majority of Northern Territory ferns are restricted to perennial soaks. Basket and pot culture are made easy by rigging up a simple watering system such as trickle irrigation under the eaves. Garden soaks can be reaily established in a protected area, for example under a low spreading tree, using spray or drip units to stimulate waterfall misting or rainforest environments.

Like most native plants, ferns are susceptible to fertilizer burn. A safe approach is to use a foliar spray of one of the many mild organic preparations or, in the garden, a light dressing of blood and bone or washed seaweed.

Apart from the vary basic requirements of watering and regular feeding, a recognition of the particular ecological niche of individual species

provides additional clues for the successful cultivation of ferns. Most ferns and particularly those of the arid zone and seasonal monsoon region are restricted to very well protected areas. Ferns growing in protected positions are less susceptible to wind burn. Those species found in relatively exposed positions in open woodland grow better where there is some shelter from wind or where there is deeper moist soil to protect the fern root systems from desiccation. Noteable exceptions are the mangrove fern (Acrostichum speciosum) and the freshwater mangrove fern (Acrostichum aureum). Both will stand up to wind, full sun and salt spray. A. speciosum is noteable in that it will tolerate saltwater inundation. While a few species resent shade, most do not and have good potential as indoor plants.

Climbing and epiphytic ferns

A few Northern Territory ferns have a climbing habit. The ability to climb confers ecological advantage over woody plants or other ferns in the competition on the ecological role of climbers in more detail. Climbing ferns may be distinguished from creeping ferns by their ability to climb a suitable support.

A fern that classifies better as a scrambler than as a climber is the hay-rake fern (D.linearis.) In open soaks it is a stunted plant often no more than two hundred millimetres high. However in moist protected gullies it adopts a scandent habit climbing over itself to a height of two to three metres. The fern is sometimes slow to establish itself under cultivation but responds well to soaking and regular fertilizing. It quite readily adopts the natural scrambling habit either in a basket provided with a support for the fern to grow against or in a well shaded and protected garden soak in deep mulch.

The climbing swamp fern (S. palustris) is the most vigorous of all Northern Territory ferns. It ascends its support by means of its rhizome which it twines around the trunks of larger trees. It is common on rainforest margin where it may blanket the forest edge up to the canopy and run along freshwater creeks for thirty metres or more. Provided ample water is available, the plant will spread to give good ground cover and climb to provide an interesting feature on a tree. In well watered baskets and pots, the fern rapidly outgrows its container. Water availability appears to be the limiting factor in determining the rate of growth of this fern under cultivation. It is hardy once established.

The very attractive snake fern (Lygodium microphyllum), serpent fern (Lygodium japonicum) and dragon fern (Lygodium flexuosum) twine around their support by means of their primary rachises (stems). In the serpent fern relatively few rachises arise from the rhizome. Each rachis branches extensively and the plant thus has the ability to mass attractively over low vegetation while showing little undercanopy growth. In contrast the snake fern produces a large number of leaf stems on its rhizome and a vertical screening effect is produced for heights of up to four or five metres. The snake fern is found in boggy situations on rainforest margin or on open swamp margin in semi-shade or full sun. It is a particularly common and attractive fern. The serpent fern, while both much less common and less vigorous, is also an extremely attractive fern and is well worth growing. Under cultivation

it can be grown in full sun or in shade, for example well under the eaves. Its habitat includes moist creek banks where its roots are well protected.

The dragon fern shares the growth habits of both the snake fern and serpent ferns. It can form both delicate curtains as well as massing over low shrubs or climbing trees to heights of four metres. We have found it growing on moist shallow soils, noteable in shaded rock crevices in coastal rainforest.

Snake ferns, serpent ferns and dragon ferns grow well year round, but all have a high water requirement and all are particularly sensitive to fertilizer burn. The ferns have highly decorative scalloped fertile leaves and simple sterile leaves. Leaf form in the dragon fern is remarkably variable, young leaves are quite unlike older leaves and both sterile and fertile fronds show considerable variation depending on their location on the frond. It is certainly the most ornate of the climbing ferns found in the Northern Territory. That the snake fern is the most sun loving of the species is reflected in the fact that it will only develop fertile leaves in full sun. The serpent fern and dragon fern develop both leaf types in full shade.

The basket fern (D.quercifolia) has a thick fleshy rhizome which has enabled it to adapt to desiccating conditions. Like the ferns in the Lygodium genus, this fern has two very different leaf forms, broad nest leaves and lobed fertile fronds with conspicuous spore-bearing sori on their undersides. Persistent nest leaves trap debris providing fern with humus and nutrients as well as providing protection of the roots and rhizome against desiccation. Decaying vegetable matter such as leaf mould and banana skins help the fern to grow well under cultivation. The basket fern is an adaptable plant taking well to tree trunks, slabs and to hanging baskets, attaching itself to its support by means of roots. It takes at least several months of active growth for the fern to attach itself permanently to its support so initially it needs to be well tied up.

This very handsome fern is found naturally either as an epiphyte on tall monsoon rainforest trees or as a lithophyte on rockfaces. While the fern is sometimes found on rocky outcrops in open forest, it appears to be more common in and around rainforest.

GROUND DWELLING FERNS AND FERN ALLIES

Ground dwelling ferns are largely restricted to bogs and soaks. Noteable examples of ferns that can withstand long dry periods are the braid fern (Platyzoma microphyllum) and about eight species of Cheilanthes including the rock fern (C. tenuifolia). The rock fern is the only dry country species that can be readily cultivated in the Darwin area. It occurs occasionally in moist rock face crevices. We conclude this from our own experience and from records of attempts to cultivate drought resistant ferns found in the Northern Territory (Jones and Clemesha, 1976).

An introduced fern (Pityrogramma calomelanos), common around Darwin, is readily confused with the rock fern (Dunlop, private communication). It is easily distinguished from the rock fern however, unlike the rock fern, it has a silvery powder on the underside of mature leaves. Its success in invading native habitat can be attributed to the fact that it grow readily from spores and from our observation that it appears to occupy the same ecological niche as the rock fern.

In contrast ground dwelling ferns from permanently moist habitats are readily transplanted. The situations in which strongly water dependent ferns may be found is quite variable. The flowering fern (Helminthostachys zeylancia) appears to prefer well shaded moist soaks and has been found growing in almost pure laterite and on black soil clays adjacent to permanent swamps. The mangrove fern (A.speciosum) tolerates saltwater inundation and grows in association with landward mangroves or in moist rock crevices, while the protracting fern (Ampelopteris prolifera) grows on poorly consolidated sand bars in creek beds. This diversity of habitat type lends considerable scope for innovation in selecting aspect and the medium in which to grow ferns.

Of the forest ground dwelling ferns, the branched comb fern (Schizdea dichotoma) appears to be one of the few species to be found in isolated clumps. We have found groups of two or three plants growing in association with larger plants such as the carpentaria palm (Carpentaria acuminata) in rainforest. To date we have not been able to cultivate this fern, though one specimen survived for about eight months In a fairly open position.

The creeping swamp fern (Cyclosorus interruptus) provides one of the most striking and attractive ground covers found in Northern Territory bushland. It can be found in almost pure stands in well shaded permanent soaks. However in open swamps or on swampy creek margins it tends to grow poorly in competition with other ferns and grasses. We have established the fern in nearly full shade and in a garden soak. Its natural spread to open lawn has been slow so we have planted shade trees to facilitate establishment of the fern over a wide grassed area. Like the climbing swamp fern (S. palustris), this species has a vigorous habit under good conditions and soon outgrows a basket or pot. Leaves of the creeping swamp fern have prominently toothed margins and the highly attractive pale green fronds stand erect from the creeping and much branched rhizome. Older sections of the fern die off suddenly but new growth is unaffected.

Another creeping species that grows in natural shaded soaks or moist rocky areas is the northern kangaroo fern (Miscrosorium scolopendria). It is one of the best species for growing in baskets and pots in shade. Under these conditions the fern remains healthy and does not outgrow its container. However, it is slow to establish in open garden situations, though once established it spreads quite rapidly.

The range of the northern kangaroo fern extends from north-eastern Queensland to north-western Western Australia (Jones and Clemesha, 1976). We believe that the Top End of the Northern Territory probably represents one extreme of its range. The adaptability of this fern under cultivation is a reflection on its hardiness and from the degree of control that can be exercised over its growth.

Other ground dwelling forest ferns are also readily established. The swamp ferns of the Blechnum genus usually grow on rainforest margin or in tall paperback swamps together with other ferns such as the fishbone fern (Nephrolepis obliterata) and the snake fern (L. microphyllum). The native lasiandra (Melastoma polyanthum) is also common in these associations. The swamp fern and fishbone fern compete for space and usually one species predominates. When planted together, the northern swamp fern (Blechnum orientale) and the fishbone fern form an interesting contrast. The fishbone fern has much paler green leaves. It is difficult to grow the northern swamp fern as well as it can grow in swamps. Leaf size is much smaller and the fern is subject to wind burn and dies back whenever its high water demand is not met. Flooded pot holders remove a potential water stress problem. The native fishbone fern grows at least as well as exotic Nephrolepis species and has a much lower requirement for water than other swamp dwelling ferns. It grows best in a moist protected location, but is hardy enough to grow in an open garden situation.

Other hardy species include the two local representatives of the Acrostichum genus. They grow naturally in open swamps or soaks and will tolerate stagnant water. The freshwater mangrove fern (A.aureum) is a large and vigorous fern which rapidly becomes potbound. Both ferns become established rapidly and the mangrove fern (A. speciosum) soon forms attractive thickets. Jones and Clemesha (1976) have suggested that these ferns resent disturbance. We attribute their ready establishment to pruning of all fronds at the time of transplanting and to a regular watering programme.

The discovery of the broad shield fern, (Lastreopsis tenera), on the Lamaroo Beach scarp represents an extension of known range for this species. It was previously known from north

Queensland and is widespread throughout Asia. The fern has large attractive lacey fronds and takes readily in a fairly shadey garden soak.

Two fern allies locally common, Lycopodium cernuum and Selaginella ciliaris are more readily established than is often claimed by local gardeners. Major requirements during the establishment stage are moist shaded conditions and ample leaf mould placed around their roots. They are best established in pots or in a wind protected area in a carefully selected garden soak.

Of the aquatic ferns, the genus Marsilea is the best represented in the Top End of the Northern Territory. The four leaf clover fern (Marsilea mutica) is found on the margin of lagoons in semishade. The rhizome is long creeping and section of the fern become established immediately in a floating situation in shade.

The challenge to the naturalist in cultivating native plants is to replicate natural conditions. Ferns have adapted and become more restricted in their distribution over millenia in which aridity has gradually increased. Most species are restricted to the few small and permanently moist habitats that exist locally. Recognizing the special characteristics of these habitats is invaluable in the successful cultivation of native ferns.

Jones, D.L. and Clemesha, B.C. (1976). AUSTRALIAN FERNS AND FERN ALLIES. A.H. and A.W. Reed Pty. Ltd., Sydney.

Jones, D.L. and Gray, B. (1977). AUSTRALIAN CLIMBING PLANTS. A.H. and A.W. Reed Pty. Ltd. Sydney.

Chippendale, G.M. (1971). Check List of Northern Territory Plant. Proc. Linn. Soc. N.S.W. 96, 207 - 267.

ACKNOWLEDGEMENTS

We thank Roy Beames and Pat Kenny for their contributions and Clyde Dunlop of the Northern Territory Department of Industrial Development, Division of Primary Industry for confirming identity of plants.

SPECIES	COMMON NAME	HABITAT	PREFERRED ASPECT	CULTIVATION	WATER REQUIREMENT	FERTILIZER RESPONSE	COMMENTS
Acrostichum aureum	freshwater mangrove fern	freshwater swamps or soaks above hight tide mark	full sun	pot or garden	high	good	large fern, young fonds attractive, rapidly outgrows pots
Acrostichum speciosum	mangrove fern	landward aspect of mangrove communities subject to saltwater inundation	full sun	pot or garden	high	good	spreading fern, hardy, requires vigorous pruning to encourage new growth
Ampelopteris prolifera	protracting fern	sandy creek beds	full sun or semi shade	basket or pot	high	fair	uncommon, long trailing fronds
Blechnum indicum	swamp water fern	behind dune rainforest margin	full sun or semi shade	unknown	high	unknown	similar in appearance to northern swamp fern
Blechnum orientale	northern swamp fern	rainforest margin soaks	full sun or semi shade	pot	very high	fair	handsome fern with large fronds
Cheilanthes tenuifolia	rock ferns	sandy areas in open forest, rocky gullies	full sun or semi shade	basket, pot or garden pot	low	fair	very common hardy fern, easy propagated.
Cyclosorus interruptus	creeping swamp fern	soaks in shaded forest or open swamps	shade or filtered sunlight	basket, pot or garden soak	very high	low	attractive toothed pale green leaves, spreads rapidly in shade
Dicranopteris linearis	hay rake fern	open soaks or moist gullies	full sun or semi-shade	basket or garden soak	high	excellent	fairly common attractive open fronds, requires fertilizing
Drynaria quercifolia	basket fern	forest trees and rocky outcrops	full sun or semi shade	garden trees, slab, basket	low	fair, requires humus	common, handsome epiphyte, dormant during dry season
Helminthostachys zeylacia	flowering fern	moist shaded areas in heavy soil	shade	pot or garden soak	high	low	spores produced on flower like frond
Lastreopsis tenera	broad shield fern	shaded protected moist rocky outcrops	semi shade	pot or garden soak	high	unknown	uncommon, erect fern with lacy frond and hairy tems
Lindsaea ensifolia	common wedge fern	open soaks, moist rocky gullies	full sun or semi shade	basket, pot or garden soak	high	fair	very common, sometimes slow

							grows best in protected areas.
Lycopodium cernuum	Queensland coral fern	freshwater swamp margin, freshwater creek banks	shade	large pot or garden soak	very high	fair	fern ally, simple branching fronds, slow to establish
Lygodium flexuosum	dragon fern	well drained moist rainforest	shade or semi shade	pot or garden, requires trellis	high	unknown	extremely decorative climber, read ily established
Lygodium japonicum	serpent fern	moist creek banks	shade or semi shade	basket or pot, garden, requires trellis	high	good, easily burnt	
Lygodium microphyllum	snake fern	open swamp or rainforest margin	full sun or semi shade		very high	good, easy burnt	extremely attractive, climber potential indoor plant slow to establish
Marsilea mutica	four leaf clover fern	cooler shaded areas of lagoon margins, purely aquatic	shade or semi shade	flooded container or pond	grows only in water	unknown	attractive floating four lobed leaves in two tone greens
Miscrosorium scolopendria	northern kangaroo fern	rainforest margin soaks and waterfall overhangs	semi shade		fairly high	fair	attractive creeping fern with erect lobed fronds
Nephrolepis obliterata	fishbone fern	rainforest margin soaks	full sun or shade	pot, basket or garden	high	good	long handsome fronds, indoor or outdoor plant, outgrows baskets
Platyzoma microphyllum	braid fern	sandy areas in open forest	full sun	unknown	low	unknown	small highly divided attractive fronds, not successfully cultivated
Schizaea dichotoma	branched comb fern	forest	shade	difficult	unknown	unknown	difficult to maintain
Selaginella ciliaris	northern swamp selaginella	moist protected soaks on swamp margins	shade	mulched pot or garden soak	high	unknown	fern ally, small delicate plant with branching stems
Stenochlaena palustris	climbing swamp fern	rainforest margin	full sun	well watered pot or basket or garden soak	very high	good	very common, vigorous coarse climbing fern, good ground cover

Editor's Note.
Lastreopsis has not been recorded from the Northern Territory.

SOME ROCK-DWELLING REPTILES OF THE ARNHEM LAND ESCARPMENT.

By Stephen Swanson

The sandstone escarpment of western Arnhem Land, an area of timeless scenic beauty, immense scientific importance, and more recently, vigorous economic activity, supports animals found nowhere outside the region. A notable example is the Black-Banded Rock Pigeon (Ptilinopus cinctus), and inhabitant of remnant rainforest, and confined to the escarpment.

Mammals such as the Rock Possum (Pteropseudes dahli) and reptiles like the Giant Cave Gecko (Pseudothecadactylus lindneri) occur outside the area only in the Kimberleys of W.A. A similar zoogeographic pattern emerges with a number of escarpment inhabitants.

GIANT CAVE GECKO (Pseudothecadactylus lindneri).

The Giant Cave Gecko is one of the largest and most pugnacious of Australia's geckos, but was, until recently, unknown to science. That it could pass unnoticed is perhaps explained by prior isolation of its habitat. This 18cm gecko is restricted to the rugged sandstone escarpment of western Arnhem Land and the Kimberleys in W.A. It is an inhabitant of caves and crevices, and ventures from its retreat at night to forage on the cliffs and in small trees nearby for insects and spiders. With its pseudo-adhesive sub-digital pads and a

Giant Cave Gecko (pseudothecadactylus lindneri)

Spiny-Tailed Monitor (Varanus acanthurus)

corresponding pad on the undersurface of the tail tip, it is able to scale a perpendicular rock face with apparent ease. It is not suction, nor an adhesive process, as is often supposed, which enables these acrobats of the reptile world to defy the law of gravity, rather the complex surface of the digital pad embraces microscopic irregularities of an ostensibly smooth surface.

OENPELLI PYTHON (Python oenpelliensis)

The recently discovered Oenpelli Python is to date known from but a handful of specimens, all originating from the Arnhem Land escarpment. That such a conspicuous snake eluded discovery for so long emphasises that documentation of the Australian herpetofauna is far from complete. From the small number of known specimens it can be tentatively assumed that it is a large python. The longest measured 4.25 metres, and considering the opinion of aboriginals, one could conclude that it may exceed six metres. At this length it rivals the Amethystine Python (Liasis amethystinus) of north Queensland, considered to be Australia's largest snake. The most striking characteristics of this rare snake are its slender form, long tail and large eyes. In this respect it is reminiscent of the colubrid snakes Dendrelaphis and Boiga. The slender, prehensile body is conducive of an adept climber, which initially suggests an arboreal lifestyle. But such characteristics are equally advantageous for negotiation of precipitous rock formation, and the location of the majority of specimens collected and observed indicates that rocky cliffs are the favoured habitat. It would appear that it is largely a cave-dweller, but a specimen, located by aboriginals and collected by an officer of Territory Parks and Wildlife, was five metres above the ground, in the branches of a tree bordering Cannon Hill Lagoon, over one kilometre from the nearest rock outcrop. Little is known of it habits, but a captive specimen has fed on the Red-collared Lorikeet (Trichoglossus haematodus) and the Black Flying Fox (Pteropus alecto, Miles 1978. I encountered a grossly distended, three metre (approx.) specimen basking in dappled sunlight at the base of a cliff on a outcrop near Nourlangie Rock. Nearby were extensive rock crevices. The recently consumed animal within the snake bore the unmistakable contours of a small wallaby, possibly the Short-eared Rock Wallaby (Petrogale brachyotis), common in the vicinity. The distention was estimated to be 4-5 times the diameter of the snake's neck. The ability of snakes, particularly pythons, to swallow animals of considerably greater girth than their head is well documented, but few people realise the full extent of this capability. The jaws, connected by elasticised ligaments and studded with needle-like, recurved teeth, are dislocated and inched forward independently over the bulk of the prey,

Oenpelli Python (Python Oenpelliensis)

until the only indication of its presence is an area of distended scales midway along the snake's body.

The Nourlangie Rock specimen bore prominent scars on the body, conceivably inflicted by the teeth of a Rock Possum (Pteropseudes dahli) or Northern Native Cat (Dasyurus hallucatus). I would consider it safe to assme that both of these amimals are eaten regularly by the Oenpelli Python.

BLACK-PALMED ROCK MONITOR (Varanus glebopalma)

A number of monitors seek shelter in rock crevices, and some species, such as the Black-palmed Rock Monitor are exclusive to this habitat. The crevices are inaccessible to most predators and also offer protection from temperature extremes. It occurs in scattered environs from the Kimberleys through the Top End of the N.T. to North-western Queensland, and is one of the commonest lizards of the Arnhem Land escarpment. Its specific name refers to the small black pads arranged on the soles of the feet. These probably serve to assist this active lizard while negotiating its rocky habitat, much as rubbersoled shoes are invaluable to a herpetologist in the same environment. An adult specimen measures one metre, but much of this length is contained in its exceptionally long tail, the latter half of which is yellow. Another distinctive trait of the rock monitor is the pale grey confluent pattern on the throat.

SPINY-TAILED MONITOR (Varanus acanthurus)

The Spiny-tailed Monitor generally lives in close association with a rocky environment, but in areas devoid of rock outcrops shelters in a burrow, often amongst Triodia. It is common and widespread throughout most of northern Australia, but in the escarpment area is infrequently encountered, perhaps due to competition from the more active and abundant Black-palmed Rock Monitor (Varanus glebopalma). Its defensive behaviour involves retreating to a crevice, inflating its body, and wedging the heavily ridged tail, rendering itself virtually invulnerable to extrication. In contrast to Spiny-tailed Monitors elsewhere, the distinctive escarpment colour variety is scattered with black spots and bars on the dorsal surface.

MAJOR SKINK (Egernia frerei)

The range of this large skink is somewhat paradoxical. It occurs in three isolated areas; costal Queensland,southern New Guinea and Arnhem Land. Arnhem Land specimens are sombre in colour compared to their eastern counterparts, and the juvenile has yellow spots grouped into cross-bands (Keith Martin pers.comm.) rather than random spotting of the flanks like Queensland juveniles. The specimen illustrated is one of

Blacked-Palmed Rock Monitor (Varanus glebopalma)

Major Skink (Egernia frerei)

a number inadvertently trapped by officers of Territory Parks and Wildlife, at the base of Little Nourlangie Rock, during mammal survey procedures. The Major Skink is a shy, diurnal lizard, and grows to approximately 60cm (Little Nourlangie Rock, Keith Martin pers. comm.)

REFRENCES

COGGER, H.G. (1975). Reptiles and Amphibians of Australia, Reed, Sydney.
GOW, G.F. A New Species of Python from Arnhem Land. Aust. Zool. 19(2).
MILES G. (1978) The Oenpelli Python Story. Ranger Review. (May 1978).

ACKNOWLEDGEMENTS

I wish to thank Ross Pengilly of Territory Parks and Wildlife for the opportunity to photograph Egernia frerei and Varanus acanthurus.

NOTES ON THE BIOLOGY OF Nephrurus asper

Gunther 1876

By Graeme Gow

DESCRIPTION:

The rough knob-tailed Gecko is the largest of the seven members of this genus (Cogger 1975), attaining a recorded maximum length of over 15 cm. It has been described as a grotesque species (Longman 1918) since it has extremely large head, a robust body covered with clusters of tubercles (which are more prominent on the nape, sides, back legs and dorsum), spindly legs and a short tail which terminates in a "bead-like" knob. The Dorsal colouration is grey or brown with or without irregular whitish crossbands. The ventral surface is white.

HABITAT PREFERENCES

Throughout this gecko's wide distribution I have alway found it favours rocky areas, where it usually lives in a burrow beneath large boulders or well embedded rocks.

ACTIVITY

It emerges on warm nights to feed upon small insects and spiders. When stalking prey this gecko raises its body high off the ground and takes a few quick forward steps, then pauses momentarily, to measure the striking distance required to secure its prey.

DEFENSIVE BEHAVIOUR

When agitated it raises and lowers its body, at the same time twitching its tail. If attempts are made to handle this species, it becomes aggressive, and with mouth agape charges its adversary, and at the same time emitting low pitched vocalisations It will bite if the opportunity arises but its jaws are too weak to inflict damage on an unwary finger! Unlike most other Australian geckoes, this species cannot cast its tail.

The Rough Knob-tailed Gecko (Nephrurus asper)

REQUIREMENTS IN CAPTIVITY

I have found this species is easy to maintain in captivity provided it is given a good depth of sandy soil and suitable rock to burrow under. Its food preference is cockroaches, although small grasshoppers and skinks are readily consumed.

REPRODUCTION

A large female (total length 13.4 cm) was collected by N. Boyd at Katherine, N.T. on 09.11.73 at 22 00 hours. The temperature was 21° C, and it was raining lightly. This specimen was observed to be gravid, as two large well developed eggs were clearly visible; the lizard had apparently just left its burrow as reddish soil covered its body, especially on the head.

The female was inspected daily until 28.11.73 when it became that it was close to laying. A small glass aquarium was then prepared with moist peat moss to a depth of about 5 centimetres. On the 2.12.73 the lizard became very active and for two hours explored all aspect of the ground surface. Finally a corner site was selected and then a hole approximately 2.5. centimetres deep was initially excavated. A laying position was then assumed by standing high on the front legs and arching the back downwards so that the vent was immediately above the hole. This position was maintained and abandoned several times over the next two days. On the 5.12.73 it was observed that the entire hole had been filled in and the specimen had layed its eggs; the surface of the peat moss was without noticeable signs of an excavation having been made. The female was then removed and the cage examined carefully for its contents; the peat moss was also removed which revealed two large eggs deposited on the cage bottom. The two eggs measured 30 mm x 16.5 mm and 29 mm x 15.5 mm respectively.

When the female began excavating the egg chamber, it appeared that it was complete at ca. 2.5cm in depth. However, the eggs were found at the base of the peat moss, depth ca.5 cm, as the eggs were resting on the bottom of the aquarium. It may indicate that a deeper burrow was intended.

Both eggs were then placed in a small container of damp peat moss, and appeared to be developing during the following weeks. However, both were destroyed by insects before they could hatch.

Eggs of the Rough Knob-tailed Gecko (Nephrurus asper).

LITERATURE

BUSTARD, R. (1970) - Australian Lizards - Collins Sydney and London.
COGGER, H.G. (1975) - Reptiles and Amphibians of Australia, Reed, Sydney.
LONGMAN, Heber A. (1918) - Notes on some Queensland and Papuan Reptiles, Mem. Qld. Mus. 6:37.
McPHEE D.R. (1963) - Some Common Snakes and Lizards of Australia, Jacaranda, Brisbane.

NOTES ON THE RED LIONFISH AND ITS OCCURRENCE IN DARWIN WATERS.

By Keith Martin

On the 13th May, 1978, whilst on a diving trip with members of the Darwin Sub-Aqua Club, I encountered a specimen of the Red Lionfish (Pterois volitans).

The fish was located resting upside-down on the roof of a large coral overhang in about five metres of water, on the edge of a deep gutter (known locally as the "Blue Hole") at Gunn Point Reef, approximately sixty kilometres to the North-East of Darwin. On sighting the fish, I immediately returned to the nearby boat to collect my nets. On returning to the cave, I gently prodded the speci men with a net, whereupon it moved slowly into the open and offered little attempt to escape. The fish was carefully scooped up and transferred into a container back on board the boat, being paricularly careful not to damage the beautiful fins or touch their poisonous spines. Not wishing to take any chances with my prize, I headed straight back to the beach and took the Lionfish by road back to Darwin, where it was housed in a 200 litre "natural system" aquarium. The fish settled down to captivity quickly and as I write, six months later, it is still in prime condition.

About ten species of Lionfishes occur throughout the Indo-Pacific Reglon. All are of similar appearance, and could not be confused with any other group of fishes. The Red Lionfish is a common and widespread species, being distributed throughout the Indo-Pacific. In Australia, it is generally confined to the tropics, but may be encountered as far south as Jervis Bay, in Southern N.S.W. For some reason, however, Lionfish are somewhat rare in the Darwin area, and the capture of this specimen created some excitement and envy amongst local aquarists. In fact, of several members of the Sub-Aqua Club present at the time of capture, only one could recall having seen the species in Darwin previously.

Pterois volitans grows to a length of about thirty five centimetres, and has a fin ray count as follows:
DX 111/10-11; A 111/6-7; P X1V; Sc 80-105.
It has a red or brownish-red colouration (some QLD and NSW specimens are black), with numerous dark red transverse bands, usually in groups; four on the head and 24 - 28 on the body interspaced with silvery white. The fins have dark spots and blotches, the anal and caudal fins with rows of small blackish spots.

The species was first described in 1758 by Karl Linnaeus, the famous inventor of our present day system of biological classification.

Linnaeus originally placed the species in the genus Gasterosteus, and records the type locality as Amboina.

Kent (1889) first recorded the presence of P. volitans at Port Darwin, but more recent records of this fish's occurrence in the Darwin area are rather scanty. Fisheries Research Section (Div. Prim. Ind.) have a handful of specimens in their collection, mostly taken by trawlers working in the Shoal Bay area. Mr. K. Roth (pers comm.) reports the species as not uncommon off Lee Point prior to Cyclone Tracy, although it is doubtful that the cyclone had any effect on the fish's population.
Some years ago, a large Lionfish was reputed to have been caught on a handline at the main Darwin wharf, and Mr. W. Allen (pers. comm.) reports that Lionfishes are frequently observed around the wharf pylons by divers.

Pterois volitans is widely known by a variety of common names, such as the Lionfish, Turkeyfish, Fireworksfish and Butterfly Cod. I dislike the use of the latter name, as the species is totally unrelated to either the true Cod (Serranidae) or the Butterflyfishes (Chaetodontidae).
It is, in fact, a member of the large family Scorpaenidae, and is therefore closely related to the Scorpionfishes, Bullrout, Fortesque, and Stonefish.

Like all Scorpaenids, the Lionfish is in possession of a number of poisonous dorsal spines which are capable of inflicting painful or fatal injuries to humans.
Southcott (1975) reports the following symptoms resulting from Lionfish stinging: "Apart from pain, the immediate effect of an envenomation may be hypotension, bradycardia, and impairment of

respiration. On occasions oxygen therapy has been required for pulmonary oedema and other complications. Tissue necrosis has followed stingings". Although no deaths have been reported in Australia from Lionfish stings, they should be regarded as highly dangerous and no attempt should be made to touch or handle these fishes. Anyone keeping Lionfishes in a home aquarium should be especially careful when cleaning or otherwise maintaining the tank, as the curious Lionfish will often swim over to investigate your arm.

In captivity, Lionfishes are not difficult to maintain, and are a beautiful addition to any marine aquarium. To date, my Lionfish has refused to eat anything but live food. Generally, anything small enough to be caught will be eaten. For most of the time, the Lionfish glides gracefully around the aquarium. The main feeding stimulus appears to be movement, for when a small fish is placed in the tank, the fish's attitude changes from one of quiet indifference, to excited interest, coinciding with a deepening intensity of the body colouration. The fish quickly swims up to the prey with fins outstretched and propelliing itself along by lateral undulations of the caudal fin. The prey is literally sucked into the Lionfish's huge mouth. If a small animal is seen to swim into a hole, the Lionfish will wait patiently at that hole for hours, and sometimes days, until the prey reappears. On one occasion, I noticed him quietly concentrating on the base of a small piece of coral for about an hour. Suddenly, the fish jerked forward and instantly extracted a small crab from the crevice.

Although the Lionfish is a hunter by nature, it shows a remarkably innoffensive disposition towards fishes which are too large to be regarded as prey. In fact, in a mixed aquarium, its glorious fin spread is a favourite target for fin-nipping attacks by species such as Damselfishes (Pomacentridae). Therefore, it is probably best to house Lionfishes in a tank of their own, or else carefully choose their tankmates.

The Lionfish is a spectacularly beautiful, highly dangerous yet immensely interesting member of the Northern Territory's marine fauna. Its apparent scarcity in the Darwin area means that few people will have an opportunity of seeing one of these fishes. However, should you be lucky enough to encounter one of these animals, I feel sure you will be awed by this marvel of nature. But just remember - don't touch.

REFERENCES:

CARCASSON, R.H. Reef Fishes of Tropical Australia and the Indo-Pacific Region. Collins, London and Sydney 1977

EDMONDS, C. Dangerous Marine Animals of the Indo-Pacific Region. Wedneil Publ. 1975.

MUNRO, I.S.R. The Fishes of New Guinea Dept of Agriculture, N.G. 1967.

SOUTHCOTT, R.V. Australian Venomous and Poisonous Fishes. Southcott, S.A. 1975.

KENT, W.S. Preliminary Observations on a Natural History Collection made in connection with the Surveying Cruise of H.M.S. Myrmidon, at the Port Darwin and Cambridge Gulf - Sept-Nov 1888. Proc. Roy. Soc. Qld. 6: 219-42 1889.

TAYLOR, W.R. "Fishes of Arnhem Land" in Records of the American - Australian Scientific Expedition to Arnhem Land. 4 Zoology. Melbourne Uni. Press, 1964.

BOOK REVIEW

By K. Martin

AUSTRALIAN FRESHWATER FISHES
By J.S. Lake (Nelson, 1978) $7.95

Before his untimely death in 1977, John Lake was well known to many Territorians, being a past Director of the Forestry, Fisheries, Wildlife, Environment and National Parks branch of the Department of the Northern Territory. As many of the original notes and observations included in this book pertain to Northern territory fishes, it is considered appropriate to review it in this magazine.

The book is sub-titled "An Illustrated Field Guide" and to this end, the book will probably meet the requirements of the interested layman who may need to identify an Australian freshwater fish.

From a production point of view, the book is somewhat unspectacular. It is printed on rather low grade paper, which does nothing to enhance the impact of the photographs. It is not particularly well bound, and has a cardboard cover. Although the overall size (130mm x 185mm) is good for a field guide, it is felt that the quality of production is totally inadequate for this purpose. The book would deteriorate quickly if used ;in the field, partlcularly for fish identification, where it is likely to come into contact with water.

The main text is basically a species by species description of our freshwater fishes, arranged in the accepted phylogenetic order. Although information such as distribution, breeding, food, and general comments are listed for most species, some of the descriptions are very scanty, and of little value for identification. No taxonomic differences have been included and it is obvious that the author is relying heavily on the photographs for positive identification.

The author has made a genuine attempt to sort out some of the more difficult families, such as the Eel Tailed Catfishes (Plotosidae) and Rainbowfishes (Melanotaeniidae) but in doing so, has fallen into the risky practice of listing 'undescribed' species. The problem here is that, until proper research has been carried out, one cannot say for certain what the correct status of a particular form may be. Consequently, the listing of seven "undescribed" varieties of Catfishes, together with the statement (pp33-4) that a further two are uncertain identifications, will do little to alleviate the problem at hand, and is indeed, a sad reflection of the taxonomic state of this family at present.

A similar problem exists in the section on Rainbowfishes (Melanotaeniidae), where the author presents several interesting, although questionable remarks and classifications. Notably, we see a retention of the genus Nematocentris (now a widely accepted as being in the synonymy of Melanotaenia); the ommission of a description of the Desert Rainbowfish (Melanotaenia tatei), on the grounds that it is synonymous with M. maculata; the inclusion of the Strawman (Quirichthys stramineus) in the family Melanotaeniidae; and the mention of the 'undescribed' Red Finned Rainbowfish, which, unfortunately is the same as the preceding West Australian Rainbowfish. To be fair, however, a taxonomic revision of this family did not appear until after this book went to press (see Allen, 1978). It is perhaps ironic that the author did not live to see several of his 'undescribed' species formally classified, particularly the two species of Grunter noted on page 51, from the Arnhem Land Escarpment.

The text of this book is generally free of spelling and production errors. The author has included a useful distribution map on the bottom left hand corner of each page for quick reference. The map of Australia is divided into twelve drainage systems, and the distribution of each species fall broadly into one or more of these divisions. Although this format does not allow for species which have patchy or irregular distributions, this problem is generally overcome in the text. It is interesting to note that in Lake's previous book (Lake, 1971) he describes fifteen drainage systems, so the latest book has been somewhat simplified,

The chapter on introduced fishes is quite comprehensive, and makes for interesting reading. It is obvious that the author's experience with the N.S.W. State Fisheries has given him a thorough knowledge on this subject.

The last chapter of text consists of a list of marine fishes which frequently enter fresh water. Surprisingly, these species have been given somewhat cursory treatment. Although the author states in the introduction that some essentially marine fishes have been included in the main text (e.g. Silver Batfish, Butterfishes) because they have freshwater aquarium qualities, it seems anomalous that a species such as

the Mangrove Jack (Lutjanus argentimaculatus) should also be included in the "pure freshwater" section while the Ox-Eyed Herring (Megalops cyprinoides) is merely mentioned on the "marine fish" list.

The last section of the book is taken up with the 136 colour and thirteen black and white photographs. Seventeen separate photographers (including Lake) contributed to this section, and almost every species mentioned in the text is figured in colour.

A casual glance through this section will reveal however, that those photographs taken by Gunther Schmida are so far superior to all others as to almost cause an embarrassment, a fact that the author almost concedes to in the Acknowledgements. While most of the other photographs are useful for identification, particularly those of Gerald Allen's, some are of decidedly poor quality, with obvious bare aquarium backgrounds, and emaciated specimens lying on bags, backlawns, and some even impaled on sticks! The photograph of Mogurnda adspersa on page 151 is badly out of focus, and useless for distinguishing it from its close relative, M. mogurnda (pictured p150).

All things considered however, the photography of live fishes is an extremely difficult undertaking and the majority of the photographs in this book should serve their purpose for identification. It should also be remembered here that a great number of species appearing in this book have never been figured in the literature previously, let alone in colour.

"Australian Freshwater Fishes" represents a logical progression from the author's previous publication (Lake 1971), which was basically a checklist, and many of the notes mentioned in his earlier work have been corrected or otherwise updated for the current volume. Although by no means complete, this book is, almost incredibly, virtually the only volume published on the subject to date. As such, it should fill a gap on every naturalist's bookshelf, Although not written as a scientific work this volume is perhaps a little oversimplified. However, the inland angler, freshwater aquarist, or amateur naturalist armed with this volume should be capable of identifying the vast majority of freshwater fishes he may encounter.

It is unfortunate that a book of this importance has been marred by production austerity, and many potential buyers may be put off by the poor general appearance combined with a relatively high price ($7.95). However, I must recommend this book, but would add that although released in October 1978, for some reason few have appeared in the bookshops and prospective buyers may have difficulty in obtaining a copy.

Lake, J.S (1971), Freshwater Fishes and River of Australia, Nelson.
Allen, G.R. (1978), The Rainbowfishes of North Western Australia, T.F.G. Vol 26 pp91-102.

Advice to Contributors:

The N.T. NATURALIST is published bi-annually. Contributions need not be members of the N.T.F.N.C. although all members are urged to contribute. Contributions may take one of the following forms:

1. Letter to the Editor

A letter should be a short comment on a previous publication in the N.T. NATURALIST, a comment on an issue of topical interest in natural history, or a brief report of a field trip. Letters may be handwritten provided they are well presented. Only one copy of a letter is required.

2. Notes

If you have made a series of observations (for example, on the behaviour of a bird or other animal) or have noted something new or unusual in the field, then this is the place to report your findings. Contributions should be in the order of 200 - 500 words and provided with a title.

3. Articles

An article should run to a maximum of about 1500 works (four to five double-spaced typed, A4 pages) and deal with a topic in the natural sciences. It should be written in a manner intelligible to readers without a specialist knowledge of the subject. Articles should be appropriately illustrated by clear, black ink graphs, drawings, diagrams or photographs.

4. Research Papers

Longer research papers will be considered. A paper should be an original scientific communication and be fully referenced.

5. Special Contributions

Feature articles, cover designs, photographs suitable for publication, drawings and reports on field trips are welcome. Contact the editor if you have any innovative ideas.

GENERAL

Manuscripts must be submitted in duplicate, typed on one side of the page only, double-spaced with a forty millimetre margin. The Editor will be pleased to give intending authors further guidance on the preparation of manuscripts.

IMPERIAL PRINTERS - DARWIN.

journal of northern territory field naturalists club

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Cover Design: Suzanne Avery

Cover Photograph: Red Lionfish (Pterois volitans) Indo-Pacific Marine

ISSNO155-4093